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People Capabilities for Promoting Sustainability in Facilities Management Practices

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Abstract Title

Sustainability needs to be embedded throughout the life-cycle of a construction project. From project conception, planning, design, construction stage, operation and maintenance to demolition, each phase of development should embrace principles of sustainability and the stakeholder involved should be empowered with the necessary skills. Past research explored the importance of ensuring sustainability measures during the occupancy phase based on considerations of Life-Cycle Cost Analysis and a project's long-term detrimental impact on the environment. Facility managers are in a unique position to promote sustainability over longer periods of project engagement and can apply a high level of influence on the built assets through management and upgrades. There is growing interest among facility managers in incorporating sustainability measures into day-to-day practice. More, however, needs to be done. Previous studies have identified barriers such as the lack of sustainability knowledge and skills, poor access to information, and unwillingness to change among facility management (FM) practitioners and stakeholders. This inhibits proper implementation of sustainable practices in the FM sector. A number of key factors, such as knowledge discrepancy, time constraints, diversity of FM functions and a lack of incentives, require urgent remedy. The capability of FM professionals and stakeholders will be a key enabler in managing the sustainability agenda, as it is central to the improvement of competency and innovation in an organization. Compared to the attempts at developing sustainability guidelines and performance measurement, research efforts relating to people capabilities and skills are still lagging behind. This paper discusses the progress to date of a research project aimed at formulating a people capabilities framework for sustainable FM practices based on expert opinions and industry feedback. Through literature review, the paper explores the challenges of incorporating sustainability principles into general FM practices before focusing specifically on FM personnel capabilities that may impact on the implementation of a holistic sustainability agenda in real life practice. The results of an industry survey are used to propose an action framework to identify, promote and utilise people capabilities in order to promote sustainability integration in FM practices. The paper provides a useful information source for FM personnel and organizations to bridge the gap between extensive tools on sustainable design and construction assessment at the front end and the need to maintain focus throughout the project life-cycle.

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1. Introduction

The construction industry is facing major environmental challenges worldwide due to its significant impact on the environment. To generate an effective built environment and achieve sustainable construction along the project life-cycle, more attention should be paid to the occupancy phase. This effort can be carried out through the implementation of sustainable practice in building operations and maintenance activities. An emphasis on the sustainability issue during this phase is crucial based on its impact on the Life-Cycle Cost Analysis (LCCA) of a building, as well as its potentially detrimental impact on the environment (Hodges 2005; Prasad and Hall 2004; CIOB 2004).

Presently, there is an emergent interest among facilities managers and building owners to integrate sustainability measures into the management of built assets (Nielsen et al. 2009). This scenario is supported by the fact that FM personnel are in a unique position to view the entire process and influence the entire life-cycle of a facility. Facilities managers can also create long-lasting value for an organization by developing, implementing and maintaining sustainable FM practices since they are armed with the proper financial and strategic planning tools (Hodges 2005). Furthermore, past research suggests that the implementation of sustainability measures in FM activities can deliver benefits such as reducing energy consumption and waste, while increasing productivity, financial returns and standing in the community (Hodges 2005; Nielsen et al. 2009; Lai and Yik 2006).

However, despite the growing awareness of sustainability in the FM sector, very few managers and building owners positively embrace the ideas and implement them in their operations. This is due to the early stage of the sustainable development concept in FM practices, leading to a lack of the understanding and skills required to put it into action (Elmualim et al. 2008). Previous studies have identified various factors such as capabilities, knowledge and organizational issues as the barriers that inhibit sustainability implementation. Capabilities issues in achieving sustainability in FM including the lack of professional capability, capabilities discrepancies and skills and capabilities magnitude have been emphasized in several extant research studies as being crucial challenges that need to be addressed in an effort to promote sustainability (Hodges 2005; Shah 2007; Shafii et al. 2006). In addition, issues such as the lack of sustainability knowledge, knowledge chasm and challenges faced in the knowledge transfer process have been highlighted (Elmualim et al. 2009; Elmualim et al. 2010; Shah 2007; Jensen 2009). Moreover, the unwillingness of FM personnel and organizations to adopt new routines to implement sustainability in their business also contributes to current drawbacks.

In this context, there is a need for better understanding of the potential for enhancing the capabilities of FM personnel before the wider adoption of sustainability can be expected. Capabilities and skills are regarded as the key enablers in dealing with the sustainability endeavours of an organization. They are also vital to the fostering of competency in an organization so that it can innovate in a more sustainable way and vital to support the sustainability agenda in an organization (van Kleef and Roome 2007; Gloet 2006). Currently,

research that focuses on soft issues such as people's capabilities and skills is still lagging behind the efforts of developing guidelines, technical manuals and knowledge portals. Therefore, it is beneficial to explore the capabilities issues in order to support the implementation of the sustainability agenda in facilities management (FM) practices.

The purpose of this paper is twofold. First, it aims to review the literature on the sustainability agenda in the FM sector as well as discussing capability issues in supporting a sustainability agenda in FM practices. Second, it discusses the components of people capabilities that have the potential to facilitate sustainability measures in FM practices. The progress to date of this on-going project is also discussed.

2. Facilities management and sustainability

Nowadays, there is an increasing demand for built assets in line with the needs of a rising number of communities. At the same time, there is a concern for a clean environment, the preservation of nature and the welfare of future generations. These conflicting requests have to be accommodated by construction industry policy-makers in order to balance the positive and negative impacts of development project. Therefore, the established concept of sustainable construction is now taking on more issues regarding natural resources required for human existence as well as the overall quality of life for both present and future generations. However, in this respect, sustainability considerations and applications in the construction sector are still at an early stage and much needs to be done to achieve sustainability goals (Wai et al. 2009; Myers 2005). Additionally, Shah (2007) suggests that specific sectors in the construction industry, such as the FM sector, are often neglected and require the immediate resurgence and adoption of the sustainability agenda.

The importance of addressing environmental issues at the operations and maintenance phase has been proved by examining the profound effect in terms of a building's Life-Cycle Cost Analysis (LCCA) and its impact on environmental damage. According to Fuller (2010) and Hodges (2005), the LCCA for a building over 30 years indicates that initial building costs (involving the design and construction costs) would account for approximately just 2 percent of the total cost, compared to the cost during the operations and maintenance phase accounting for around 6 percent. Focusing on the construction industry's detrimental impact on the environment, the Chartered Institute of Building (2004) asserts that the built environment especially the buildings themselves use 45% of generated energy for power and maintenance, meanwhile only 5% was used during construction. Sustainability considerations during the operations and maintenance phase is crucial in the whole life-cycle of a construction project, since it impacts more on the LCCA of a building and consumes more of the organization's costs. Considering the evidence, the role of facilities managers as the stakeholders who are responsible for the operations and maintenance of built assets is vital to reducing the construction industry's impact on the environment.

The integration of sustainability measures in FM practices can deliver substantial benefits such as reducing energy consumption and waste and at the same time increasing productivity, financial returns and standing in the community (Hodges 2005; Nielsen et al. 2009; Lai and Yik 2006). The need for sustainable practices focusing on the development of

new ways of working in order to meet the sustainability criteria, as well as for skilled facilities managers to conduct tasks, is increasingly important. The role of the FM sector in a sustainability agenda can be applied to the entire life-cycle of a construction project, from design and construction to demolition, with particular focus on the operational phase (Elmualim et al. 2008). The involvement of facilities managers during the design process should result in buildings that are: (a) better suited to meeting business needs, (b) more attractive to clients, (c) easier to commission and maintain, (d) easier to control and manage, (e) more cost effective to operate and (f) better able to respond to the needs of the occupants (Jaunzens et al. 2001). According to Elmualim et al. (2008), sustainability measures can be included during the operational phase in the maintenance and repair of the physical fabric of the site. This can be achieved by obtaining resources based on sustainability criteria, minimizing waste and disposing of it responsibly and reducing energy demands. Moreover, the role of the facilities manager has grown to encompass activities such as waste minimization, recycling initiatives, energy management and utility reduction to meet the sustainability expectations of customers and clients (Shah 2007).

Unfortunately, even though the FM profession has been presented with an opportunity to make real and measurable differences by driving the sustainability agenda forward, it does not at present have easy access to the specialist knowledge, tools and supporting case study material necessary to make it a reality (Elmualim et al. 2009). The demands require FM personnel to be able to understand and effectively respond to sustainable development challenges. However, research reveals that the capabilities, skills, knowledge and commitment of FM personnel regarding the sustainability agenda are deficient in a number of areas. As a result, their ability to effectively contribute to the sustainability agenda is compromised. Previous studies have identified numerous challenges in efforts to integrate the sustainability agenda in FM practices, including capabilities and skills, knowledge, organizational culture, personal attributes, management and authority issues as presented in Table 1.

Table 1: Challenges/issues in integrating sustainability in FM practices

No	Challenges/ Issues	Description
1	Capability challenges	<ul style="list-style-type: none"> • Lack of personal capabilities/skills • Lack of professional capabilities / skills • Lack of awareness on building whole life-value • Lack of competence in managing the people / institutions' attitude to changing process • Diversity of facilities management roles
2	Knowledge challenges	<ul style="list-style-type: none"> • Lack of knowledge on sustainability endeavours in the FM sector • Limited knowledge regarding key elements of sustainable development (environmental, social and economic) • Limited knowledge regarding legislation related to sustainability • Lack of effort in managing the sustainability knowledge
3	Organizational challenges	<ul style="list-style-type: none"> • Lack of senior management commitment to sustainability • Time constraints on implementing sustainability efforts • Lack of incentives to create a routine for tackling environment issues • Unwillingness to implement sustainability • Limited resources to implement sustainability

No	Challenges/ Issues	Description
		<ul style="list-style-type: none"> • Increasing liability of FM organizations • Lack of financial support • Undervaluation of FM contribution to organization success • Limited data on local consumption of energy, water, etc • No sustainability performance indicators during operations phase • Lack of guidance documents • No sustainability policy in the FM organization

The need for the implementation of sustainable practices in FM and for skilled facilities managers to conduct sustainability functions is increasing. This is because, facilities managers and building operators are the key actors in implementing sustainable measures in building operations (Hodges 2005). Hence, it is crucial for them to have appropriate capabilities, skills and knowledge to be able to respond and act on a sustainability agenda.

Therefore, in order to support sustainability implementation in the FM sector, it is important to investigate the issue of capabilities and skills. The capabilities of FM personnel and organizations have been identified among the key enabling factors to facilitate a sustainability agenda. Moreover, the need for strong capabilities in both people and organizations is increasingly important in dealing with the requirements of sustainability practice in FM. Additionally, through a literature review, it has been identified that up to now, compared to the research efforts on external aspects (i.e.; developing guidelines, technical manuals and knowledge portals), research focusing on soft areas or people-centred orientation (i.e.; capability of people, skills, personal motivation) is still lacking and lagging behind.

3. Capabilities to implement sustainability in facilities management

Previous researchers in sustainability have highlighted the importance of personnel and organizational capabilities in achieving sustainability goals. According to Gloet (2006), to support a sustainability agenda in an organization, there are four key areas of capabilities that need to be developed, namely, learning, roles, responsibilities and strategy. These capabilities are important to ensure that ideas related to ecology, sustainability and social justice form part of management's thinking and priorities. Likewise, van Kleef and Roome (2007) have identified specific areas of the capabilities needed to encourage business to implement more sustainable practices. These include: systemic thinking capabilities, capabilities for learning and developing, capabilities to integrate business, capabilities to solve environmental and social problems, capabilities in developing alternative business models and methods, networking capabilities and coalition and finally, collaborative building capabilities. These capabilities are vital for strengthening the competency of people and organizations (particularly in managing sustainability agenda issues and challenges) to operate in a more sustainable way and to support sustainability measures.

The role of the people or human domain in efforts to implement a sustainability agenda in an organization has been considered. Jeston and Nelis (2008) claim that the most important component in any business innovation is the management of organizational change

associated with people/staff impacts and providing staff with the skills and capability to ensure they will be able to execute their job to a high standard. The people within the organization must have the knowledge and skills to be able to continuously improve the business processes, as well as to measure and manage business in a way that leads to the betterment of the organization.

The contribution of the human resources domain in the successful integration of environmental management in an organization should be given more attention since it has a crucial role in stimulating the accomplishment of the organization's sustainability goals (Jabbour and Santos 2008; Boudreau and Ramstad 2005). According to Govindarajulu and Daily (2004), human resource dimensions play an important role in ensuring the effectiveness of an environmental management system together with the required technical aspect. Similarly, del Brío and Junquera (2003) agree that environmental management is human resource-intensive and depends much on the development of tacit skills through the employees' involvement. Therefore, environmental management and sustainability efforts in an organization are a complex process, which requires support from the area of human resources and people capabilities and skills in order to guarantee the success of its implementation.

In the FM industry, the issue of capabilities in achieving sustainability goals has been highlighted by Shah (2007), Shafii et al. (2006), Hodges (2005) and Yang et al. (2005) as being a challenge that requires remedying. The necessity for sustainable practice in FM and for capable facilities managers to facilitate this practice is becoming increasingly challenging. The involvement of the FM function is required in all aspects, with a focus on environmental and economic activities. Therefore, FM personnel and organizations need to improve their capabilities and skills in order to conduct this task efficiently in order to further the sustainability agenda in their operations. The focus of this research is on people capabilities within the organization or work-related context due to the promising opportunity that it brings to organizational growth and performance. It is also vital for transferring existing skills and knowledge to a new situation, such as the sustainability endeavours in an organization.

4. Potential people capability components to promote sustainability in facilities management practices

The authors have developed potential people capability components to facilitate a sustainability agenda in FM practices from an extensive review of past research as summarised in Figure 1. These components contribute to the environmental, social and economic objectives of sustainable development.

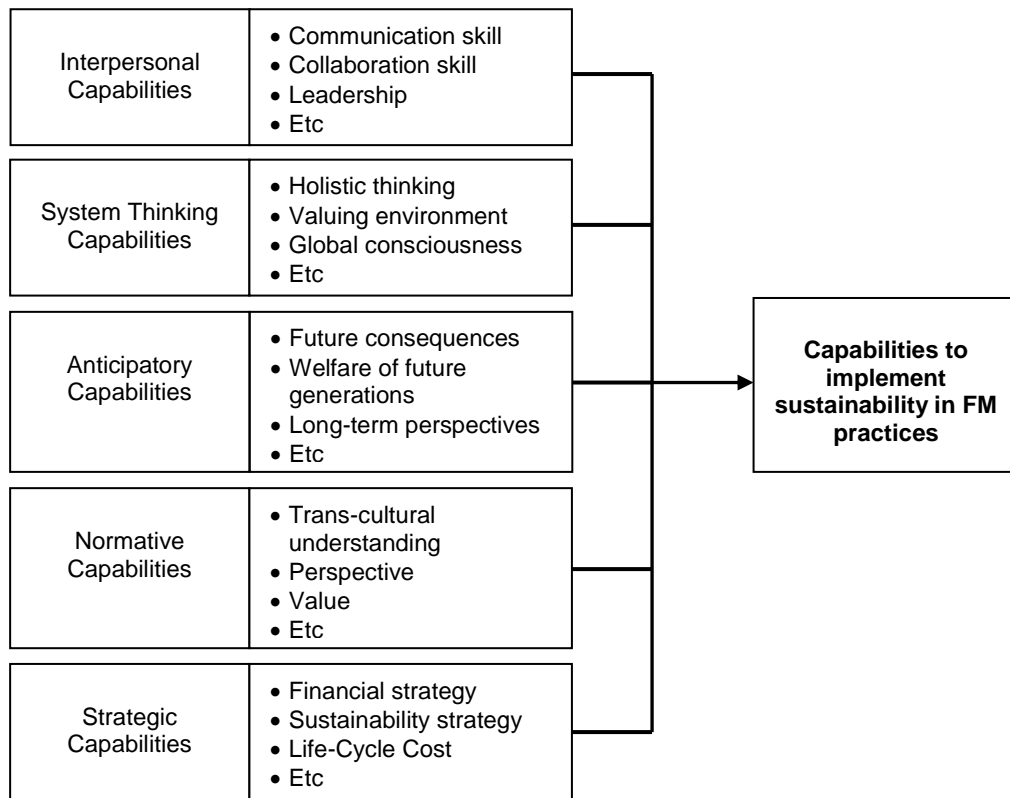


Figure 1: Components enhancing people capabilities in implementing sustainability in FM

Each component consists of attributes that can be designed and weighted differently depending on their importance in facilitating people capabilities. Five major components were identified as having the potential to enhance people capabilities to implement sustainability measures in the FM industry. The components are: 1) interpersonal capabilities; 2) system thinking capabilities; 3) anticipatory capabilities; 4) normative capabilities; and 5) strategic capabilities. These people capability components are based on the Wiek et al. (2011) classification for similar applications. Interpersonal capability refers to the ability to facilitate and enable FM personnel to solve the issues and challenges related to the sustainability application. System thinking capability is the ability to analyse complex systems across different pillars of sustainability (environment, society and economy) and over different scales. Anticipatory capability is the ability to analyse and evaluate related sustainability issues that may happen as a consequence of a present action. Normative thinking capability is the ability to map, apply and reconcile sustainability values, principles and goals that a person should know in terms of practices that should be discarded and those which must be maintained to sustain the balance of nature. Finally, strategic capability is the ability to design and implement specific strategies towards the implementation of sustainability in an organization.

A list of attributes from these five major components were included in a questionnaire to assist the industry to identify the crucial people capabilities in facilitating sustainability implementation in FM. The people capabilities are identified through a wide range and variety of experiences for sustainability considerations and involve a significant number of researchers and practitioners. Therefore, there is a need to identify the most relevant and

critical aspects suitable for sustainability endeavours in the FM context through surveys of the local industry. The survey design is introduced in the following section.

5. Questionnaire survey and on-going research

In this research, a questionnaire survey was administered to ask the industry participants what capabilities they consider most important for facilitating the implementation of sustainability measures in FM practices. Single choice questions, multi-choice questions and five Likert scale questions with open-listed items were adopted in the questionnaire design. A structured questionnaire consisting of five (5) sections was designed according to the key elements of the people capabilities based on the findings from an extensive literature reviews. Table 2 shows the structure of the questionnaire.

Table 2: Structure of the questionnaire

	Category	Questions
1	Respondents general information	This section collects basic information in order to classify respondents. (e.g. professional roles in FM industry, length of professional experience, type of organizations)
2	Barriers for sustainability agenda in the FM sector	This section collects information to identify the impact of each barrier in the effort to integrate the sustainability agenda into FM practices. These barriers are categorized into three main challenges namely, capabilities, knowledge, and organization.
3	Attribute of people capabilities to promote sustainability in the FM sector	This section collects professional opinions to indicate the significance of people capability attributes in enhancing sustainability in FM practices. These people capabilities have been categorized into five components: <ul style="list-style-type: none"> • Interpersonal capabilities (25 attributes) e.g. development of communication skills, collaborative skills, ability to motivate, leadership skills. • System thinking capabilities (6 attributes) e.g. valuing environment, global consciousness, critical thinking. • Anticipatory capabilities (8 attributes) e.g. identifying short-term and long-term consequences. • Normative capabilities (5 attributes) e.g. trans-cultural understanding, cooperation. • Strategic capabilities (16 attributes) e.g. understanding organization's financial strategy, Life-Cycle Cost.
4	Further comments / issues relevant to people capabilities	This section invites respondents to provide further comments in regard to the research topic.
5	Further information	This section invites respondents to provide their contact information if they are willing to participate in the subsequent case study.

Respondents representing key stakeholders in the FM industry were carefully selected from various types of organizations involved in FM projects from both the private and public sectors across Australia. An appropriate sampling of FM personnel is necessary because it is rarely possible to examine an entire population of respondents due to the resource restrictions in most studies. According to Fellows and Liu (2008), the objective of selective

sampling is to provide a practical means of enabling the data collection and processing components of research to be carried out. For the purpose of this research, the survey sampling was drawn randomly from Australian FM stakeholders with different characteristics, particularly in terms of respondents' professional position, types of organization, level of education and years of experience. The respondents identified for this study included company directors, experienced facilities managers, business managers, building engineer and other professional personnel from diverse organizations such as clients, consulting firms, FM contractors, sub-contractors, government agencies and local authorities.

Around 120 questionnaires were sent out directly to the identified FM stakeholders through a web-based survey tool. To date, the authors have received over 30 valid questionnaires. A 30%+ response rate is expected. Information obtained from the survey will be used to identify key attributes of people capability components in order to facilitate sustainability measures in FM practices. A preliminary framework of people capabilities will then be developed based on the findings. Afterwards, selected case studies will be adopted to test and verify this preliminary framework and to generate the development of the contextual and visual representation of the final framework.

6. Conclusion

Compared to design and planning, the facilities management sector of the construction industry is facing a greater challenge to support the sustainability agenda. In addition to energy efficiency issues, facilities managers are now required to respond to all aspects of sustainability in this important part of the project life-cycle. Past research has revealed the lack of knowledge and skills among FM personnel and the need to enhance their capabilities in order to cope with new challenges.

In response to this, a study on people capabilities in FM is being carried out to explore current problems hindering knowledge and skill improvement and to identify possible solutions. Five major components affecting FM personnel have been identified as: 1) interpersonal capabilities; 2) system thinking capabilities; 3) anticipatory capabilities; 4) normative capabilities; and 5) strategic capabilities. A questionnaire survey is being conducted to explore the opinions of FM stakeholders on how they identify and interpret these key components and what practical solutions may exist to uplift the current standards. Critical attributes will be incorporated into a framework during the next phase of research, in an attempt to equip the FM team with a tool to collect the right knowledge, continue education and develop new mindsets to enhance the integration of sustainability measures with FM practices.

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